Journal of the Society of Arts.

FRIDAY, OCTOBER 30, 1863.

NOTICE TO MEMBERS.

The One-Hundred-and-Tenth Session of the Society will commence on Wednesday, the 18th November, at 8 o'clock, when William Hawes, Esq., F.G.S., Chairman of the Council, will deliver the Opening Address. The Chair will be taken at eight o'clock on the following Wednesday evenings:—

1863. November	—	—	18	25	
„ December	2	9	16	—	—
1864. January	—	—	20	27	
„ February.....	3	10	17	24	
„ March	2	9	16	—	30
„ April	6	13	20	27	
„ May.....	4	11	18	25	
„ June	—	—	—	29*	

For the Meetings previous to Christmas the following arrangements have been made:—

November 18.—Opening Address by William Hawes, Esq., F.G S., Chairman of the Council.

**** *On this evening the Prince Consort's Prize, awarded at the last Examination, and the Prizes awarded to the Art-workmen who were successful competitors at the Wood-carving Exhibition held in June last, will be distributed.*

November 25.—"New South Wales, and its Commercial Resources." By Sir Charles Nicholson, Bart.

December 2.—"On Magneto-Electricity, and its Application to Lighthouse Purposes." By F. H. Holmes, Esq.

December 9.—"Recent Agricultural Progress and its Causes." By J. Chalmers Morton, Esq.

December 16.—"On the Economic Value of Foods, having special reference to the Dietary of the Labouring Classes." By Dr. Edward Smith, F.R.S.

The Council have made arrangements for the delivery of Courses of Lectures on the following subjects during the ensuing Session:—

Fine Arts Applied to Industry. By W. Burgess, Esq.
Chemistry Applied to the Arts. By Dr. F. Crace Calvert, F.R.S.
International Commerce. By G. W. Hastings, Esq., Barrister-at-Law.

These Lectures will be open to Members and their Friends on the same conditions as the Ordinary Meetings. Particulars of the Courses will be duly announced.

THE WEDGWOOD INSTITUTE.

The foundation stone of an Institute about to be erected at Burslem to the memory of Josiah Wedgwood, who died in 1797, was laid by the Right Hon. W. E. Gladstone on Monday, the 26th inst

The present scheme of the Wedgwood Institute was mooted so long ago as 1858, but it had to contend with various difficulties. These, however, have been now happily surmounted, and a liberal sum has been subscribed, an appropriate site close to Wedgwood's birthplace and his old works has been purchased, the requirements of the government have been complied with, so that a handsome grant may be confidently looked for, and Mr. Ewart's Public Libraries and Museums Act has been adopted by the ratepayers almost without a dissentient voice. This measure will authorise the levying of a penny rate for the support of the Institution, and it is estimated that it will yield not less than £200 a year. The design for the building is by Mr. G. B. Nicholls; but at a conference of the subscribers held in February last, Mr. A. J. B. Beresford Hope suggested that premiums should be offered for the adornment of the principal façade in ceramic work, with mouldings in terra cotta, panels of della robbia, or mosaics in tessera, and these will form an important feature in the decoration of this building. Its internal arrangements seem to be all that can be desired in point of convenience. They will comprise schools of art, both for male and for female students, a free public library, a library of reference, a museum, and a modelling room.

At one o'clock the Chancellor of the Exchequer entered the tent under which the ceremony was to take place, and he was received with enthusiastic cheering. There were present Earl Granville, the Bishop of Lichfield, Viscount Ingestre, Mr. Lowe, M.P., Mr. Adderley, M.P., Sir James Duke, M.P., Mr. Grenfell, M.P., Mr. Ewart, M.P., Mrs. and Miss Gladstone, &c.

The proceedings were commeuced by the presentation of an address to the Chancellor of the Exchequer, which was duly acknowledged.

The foundation stone was then laid with the usual ceremonies, prayer having first been offered by the Bishop of Lichfield.

Mr. Gladstone then read the following paper:—We have now laid this stone in honour of Josiah Wedgwood, with a view, as I hope, to the permanent and effectual benefit of the people of his birthplace. The occupations and demands of political life compel many of those who pursue it, and myself among the number, to make a rule of declining all invitations of a local character, except such as lie within their own immediate and personal sphere; but when I received, through one of your respected representatives, an invitation to co-operate with you in the foundation of the Wedgwood Institute, I could not hesitate to admit that a design of this kind was, at least in my view, not a local, but, when properly regarded, rather a national design. Partly it may be classed as national, because the manufacture of earthenware in its varied and innumerable branches is becoming, or has indeed become, one of our great and distinguishing British manufactures. But it is for another and a broader reason that I desire to treat the purpose you have now in hand as a purpose of national rather than merely local or partial interest. It is because there are certain principles applicable to manufacture by the observance or neglect of which its products are rendered good or bad. These principles were applied by Wedgwood with the consistency and tenacity that cannot be too closely observed. These principles, being his and being true, were also in no small degree peculiar to his practice, and deserved to be in the permanent annals of art especially associated with his name. I am engaged, as I am aware, in a somewhat perilous undertaking, for, having to speak to you about a man and a business, I am obliged to begin by confessing what, if I did not confess it, you would soon discover for yourselves, namely, that of both of them my knowledge is scanty, theoretic, and remote, while you breathe the air, inherit the traditions, in some cases bear the very name of the man, and have a knowledge of the business, founded upon experience and upon interest in all its turns and stages, and from its outer skin, so to speak, to its innermost core. It is the learner who for the moment stands in the teacher's place, and instead of listening with submission seems to aim at speaking with authority. It would be easy to enlarge in this course of remark, but I

* The Annual General Meeting: the Chair will be taken at Four o'clock. No Visitors are admitted to this Meeting.

must stop, or I shall soon demonstrate that I ought not to be here at all. Let me then offer something on the same side. First, I have to assure you that whatever I shall say I submit with entire deference to the judgment of those who are better informed, and with a full confidence that if erroneous it will be corrected, and if false exploded. Secondly, as an observer, according to my limited capacity and means, of fictile manufacture in its various branches, I have formed deliberately so very high an estimate of Wedgwood in relation not merely to his particular business, but to the general laws of industrial production, that I am glad to have an opportunity of stating it fully and fairly in order to bring it to trial by the public judgment; and thirdly, in the office which I hold as a servant of the Crown, and which places me in incessant contact with the industry of the country in its several branches, I am anxious, from the deep interest which I feel in its welfare, to bear my testimony to the principles of which Wedgwood was, so to speak, an apostle, and moreover to give to that testimony any little weight which such an office, and such a deep interest and near relations established by it, may be likely, in the absence of higher qualifications, to impart. Thirty years ago it would probably have been held by many, and it may still be the thought of some, that the matters of which I have now to speak are matters which may well be left to regulate themselves. To vindicate for trade in all its branches the principle and power of self-regulation has been for nearly a quarter of a century a principal function of the British parliament. But the very same stage in our political and social existence which has taught us the true and beneficial application of the laws of political economy, has likewise disclosed to us the just limits of the science, and of the field of its practical application. The very same age which has seen the State strike off the fetters of industry, has also seen it interpose with boldness for protection of labour. The same spirit of policy which has taken from the producer the enjoyment of preferences, paralysing to him and most costly to the community at large, has offered him the aid of knowledge and instruction, by whatever means either of precept or example public authority could command. We may consider the profits of industry with reference to their utility or to their cheapness, or to their influence upon the condition of those who produce them; or, lastly, to their beauty—to the degree in which they associate the presentation of forms and colours agreeable to the cultivated eye, with the attainment of the highest aptitude for those purposes of common life for which they are properly designed. Now, as to their utility and convenience, considered alone, we may leave that to the consumer, who will not buy what does not suit him. As to their cheapness, when once security has been taken that an entire society should not be forced to pay an artificial price to some of its members for their productions, we may safely leave the question to the action of competition among manufacturers, and of what we term the laws of supply and demand. As to the condition of the work-people, experience has shown, especially in respect to the factory acts, that we should do wrong in laying down any abstract maxim as an invariable rule. Generally, it may be said, that the presumption is always against legislative interference, but that upon special grounds, and most of all where children are employed, it may sometimes not only be warranted but required. This, however, though I may again revert to it, is not for to-day our special subject. We come, then to the last of the heads which I have named—the association of beauty with utility, each of them taken according to their largest sense in the business of industrial production. And it is in this department that I conceive we are to look for the peculiar pre-eminence, I will not scruple to say the peculiar greatness, of Wedgwood. Do not let us suppose that when we speak of this association of beauty with convenience we speak either of a matter which is light and fanciful, or of one which may, like some of those I have named, be left to take care of itself. Beauty is not an accident of things. It pertains to their essence, it pervades the wide range of creation, and wherever it is impaired or banished, we have in this fact the proof of the moral disorder which pervades the world. Reject, therefore, the false philosophy of those who will ask, "What does it matter, provided a thing be useful, whether it be beautiful or not?" and say, in reply, that we will take our lesson from Almighty God, who in His works hath shown us, and in His Word also hath told us, that "He hath made everything"—not one thing or another thing, but everything—"beautiful in his time." Among all the decrees of creation, there is not one more wonderful—whether it be the movement of the heavenly bodies, or the succession of the seasons and the years, or the adaptation of the world and its phenomena to the conditions of human life, or the structure of the eye or hand, or any other part of the frame, of man—not one of these is more wonderful than the profuseness with which the mighty Maker has shed over the works of His hands an endless and boundless beauty. And to this constitution of things outward the constitutional mind of man, deranged although it be, still answers from within. Down to the humblest condition of life, down to the lowest and most backward grade of civilization, the nature of man craves, and seems as it were even to cry aloud for something—some sign or token, at the least, of what is beautiful in some of the many spheres of mind or sense. It is that which makes the Spitalfields weaver, amid the murky streets of London, train canaries and bulfinches to sing to him at his work, that fills with flowerpots the windows of the poor, that leads the peasant of Pembrokeshire to paint the outside of his cottage in lively colours, and prompts in the humbler classes of women a desire for some little personal ornament, certainly not without its dangers (for what sort of indulgence can ever be without them?), yet sometimes, perhaps, too sternly repressed from the high and luxurious places of society. We trace the operation of this principle yet more conspicuously in a loftier region; in that instinct of rational and Christian piety which taught the early masters of the fine arts to clothe the noblest objects of our faith, and especially the idea of the sacred person of our Lord, in the noblest forms of beauty that their minds could conceive, or their hands could execute. It is, in short, difficult for human beings to harden themselves at all points against the impression and the charm of beauty. Every form of life that can be called in any sense natural will admit them. I know not whether there is any one among the many species of aberration that renders a man so entirely callous as the lust of gain in its extreme degrees. That passion, where it has full dominion, excludes every other. It shuts out even what might be called redeeming infirmities, it blinds men to the sense of beauty as much as to the perception of justice and right. Cases might be named of countries where greediness for money holds dominion, and where unmitigated ugliness is the principal characteristic of industrial products. On the other hand, I do not believe it extravagant to say, that the pursuit of the element of beauty in the business of production will be found to act with a genial chastening and refining influence on the commercial spirit; that up to a certain point it is in the nature of a preservative against some of the moral dangers that beset trade and manufacture and enterprise, and that we are justified in regarding it not merely as an economical benefit—not merely as contributing to our work an element of value—not merely as supplying a particular faculty of human nature with proper food, but as a liberalising and civilising power, and an instrument in its own sphere of moral and social improvement. Indeed, it would be strange if a deliberate departure from what we see to be the law of nature in its outward sphere was the road to a close conformity with its innermost or highest laws. But now but let us not conceive that, because the love of duty finds for itself a place in the general heart of mankind, therefore we need never make it the object of special attention, or put in action special means to promote and uphold it. For, after all, our attachment to it is a matter

of degree, and degree which experience has shown to be in different places and at different times indefinitely variable. We may not be able to reproduce the time of Pericles or of the Cinque Cento, but yet it depends upon our own choice whether we shall or shall not have a title to claim kindred, however remotely, with them. What we are bound to is this, to take care that everything we make shall in its kind and class be as good as we can make it. When Dr. Johnson—whom Staffordshire must ever place among her most distinguished ornaments—was asked by Mr. Boswell how he had attained to this extraordinary excellence in conversation, he replied that he had no other rule or system than this, that whenever he had anything to say he tried to say it in the best manner he was able. It is this perpetual striving after excellence on the one hand, or the want of such effort on the other, which more than the original difference of gifts, contributes to bring about the differences we see in the works and characters of men. Such efforts are more rare in proportion as the object in view is higher, the reward more distant. In the application of beauty to works of utility the reward is generally distant. A new element of labour is imported into the process of production, and that element, like others, must be paid for. In the modern publication which the firm of Wedgwood and Bentley put forth under the name of a catalogue, but which really contains much sound and useful information on the principles of industrial art, they speak plainly on this subject. They say:—"There is another error common with those who are not over well acquainted with the particular difficulties of a given art. They often say that a beautiful object can be manufactured as cheaply as an ugly one. A moment's reflection would undeceive them." The beautiful object would be dearer than one perfectly bare and bald, not because utility is compromised for the sake of beauty, but because there may be more manual labour, and there must be more thought in the original design. Therefore the manufacturer, whose daily thought must and ought to be to cheapen his productions, endeavouring to dispense with all that can be spared, is under much temptation to decline letting beauty stand as an item in the cost of production. So the pressure of economical laws tells severely on the finer elements of trade. And yet it may be argued that, in this as in other cases—in the case, for example, of durability and solidity—that which appears cheapest at first is not cheapest in the long run. And this for two reasons. In the first place, because in the long run mankind are willing to pay a price for beauty. France is the second commercial country in the world, and her command of foreign markets seems clearly referable in a great measure to the real elegance of her productions, and to establish in the most intelligible form the principle that taste has an exchangeable value. But there seems to be another way by which the law of nature arrives at its revenge upon the short-sighted demand for cheapness. We begin, say, by finding beauty expensive; we decline to pay artists for producing it. Then employment ceases, and they disappear. Presently we find that works reduced to utter baldness do not satisfy. We have to meet a demand for embellishment of some kind, but we have starved out the race who knew the laws and mode of its production. We substitute strength for flavour, quantity for quality, and we end by producing incongruous excrescences, or hideous malformations, at a greater cost than would have sufficed for the nourishment among us of chaste and virgin art. So the penalty of error may be certain, but the reward of sound judgment and right action, depending as it does not on to-day or to-morrow, but on the long future, is remote. In the same proportion it is wise to call in aid all the secondary resources we can command. Among these instruments, and among the best of them, is to be reckoned the foundation of institutes like this, for they not only supply the willing with means of instruction, but they bear witness from age to age to the principle on which they are founded. They carry down the tradition of good times through the slumber and the night of bad times, ready to point the path to excellence, when the dawn returns again. I heartily trust the Institute may be one worthy of its founder and of its object. But now let us draw nearer to the immediate character and office of him whom I may call our hero. His most signal and characteristic merit lay in the fineness and fulness of his perception of the true law of what we term industrial art, or, in other words, of the application of the higher art to industry. The law which teaches us to aim first at giving to every object the greatest possible degree of fitness and convenience for its purpose, and next, at making it the vehicle for the higher degree of beauty which compatibly with that fitness and convenience it will bear; and does not substitute the secondary for the primary end, but recognises as part of its business the duty to harmonise the two. To have a strong grasp of this principle, and to work it out in its results, in the details of a vast and varied manufacture, is praise high enough for any man. But it was higher and heartier in the case of Wedgwood than any other man. For that truth of art which he saw so clearly, and which lies at the root of excellence, was one of which England has not usually had a perception at all corresponding with her other rare endowments. She has long taken lead among the nations of Europe for the cheapness of her manufactures. Not so for their beauty; and if the day shall ever come when she shall be as eminent for taste as she is now for economy of production, my belief is that that result will probably be due to no other single man in so great a degree as to Wedgwood. This part of the subject, however, deserves a fuller consideration. There are three regions given to man for the exercise of his faculties in the production of objects, and the performance of acts conducive to civilisation and to the ordinary uses of life. Of these, one is the homely sphere of simple utility. What is done is done for some purpose of absolute utility or immediate use. What is produced is produced with an almost implicit regard to its value and exchange, to the market, the place, and day. A dustman cannot be expected to move with the grace of a fairy, nor can his cart be constructed on the flowing lines of a Greek chariot of war. Not but that even in this unpromising domain, beauty also has her place. Then, there is the lofty sphere of pure thought and its ministering organs, the sphere of poetry and the highest arts. Here, again, the place of utility is narrowed, and the production of the beautiful in one or other of its innumerable forms is the supreme if not the only object. I believe it to be undeniable that in both of these spheres, widely separated as they are, the faculties of Englishmen and the distinctions of England have been of the very first order. In the power of economical production she is at the head of all the nations of the earth. If in the fine arts—in painting for example—she must be content with a second place—yet in poetry, which ranks even higher than painting, she may fairly challenge all the nations of Christendom, and none but Italy can as yet enter into serious competition with the land of Shakspeare. I for one should admit that while thus pre-eminent in the pursuit of pure beauty on the one side, and of unmixed utility on the other, she has been far less fortunate in that intermediate region where art is brought into contact with industry, and where the pair may wed together. This is a region alike vast and diversified. Upwards it embraces architecture, an art which while it affords the noblest scope of grace and grandeur, is, or rather ought to be, strictly tied down to the purposes of convenience. Downwards it extends to a very large proportion of the products of human industry; but while all the objects of trade and manufacture admit of fundamental differences in point of fitness and unfitness, probably the major part of them admit the fundamental differences also in point of beauty or ugliness. Utility is not to be sacrificed for beauty, but they are generally compatible, and often positively helpful to each other; and it may be safely asserted that the periods when the study of beauty has been neglected have

usually been marked, not by a more successful pursuit of utility, but by a general decline in the energies of man. In Greece the season of her highest historic splendour was also the summer of her classic poetry and art; and in contemplating her architecture, we scarcely know whether most to admire the acme of beauty, or the perfect obedience to the laws of mechanic contrivance. The arts of Italy were the offspring of her freedom—and with its death they languished and decayed. In the particular department of industrial art, France, perhaps of all modern nations, has achieved the greatest distinction, and there is no country which has displayed through a long course of ages a more varied activity or acquired a greater number of titles to renown. It would be easy to show that the reputation which England has long enjoyed with the trading world was for cheap and not beautiful productions. In some great branches of manufacture we were until late dependent upon patterns from abroad. In others our work presented nothing but a dreary waste of capricious ugliness. Some of us remember with what avidity thirty or forty years back the ladies of England smuggled every article of dress and ornament from France. That practice having now ceased, partly perhaps because there are no longer any duties to evade, but also because the preference has in some degree become modified because of the great progress made in the taste which this country applies to industry, I have understood that for some of the textile fabrics patterns are not imported only, but also exported and exchanged. Let us treat this as a matter of blame to our forefathers and commendation to ourselves. It has not been sufficiently considered what immense disadvantages are brought on the country, as respects the application of fine art to industry, by the great revolutionary war. Not only was the engrossing character of a deadly struggle unfavourable to all such purposes, but our communion with the civilised world was placed under restraint, and we were in great measure excluded from a resort to those cities and countries which possess in the greatest abundance examples bequeathed by former excellence. Nor could it be expected that kings and governments absorbed in a conflict of life and death, and dependent for the means of sustaining it on enormous and constant loans, would spare either thought or money from war and its imperious demands for these, the most pacific among all the purposes of peace. At any rate, I take it to be nearly certain that the period of a war was a period of general and progressive depression, and even degradation in almost every branch of individual art. The fabrics of your own manufacture, for example, were in point of beauty inferior to what they had been at a former time; others, such as those of Worcester, for instance, declined, and whereas Wedgwood is said to have exported five-sixths of what he made, we had not only lost any hold such as he had gained upon the foreign market, but we owed the loss in part at least to our marked decline in excellence and taste. I submit, however, that considering all that England has done in the sphere of pure beauty on the one side, and in the sphere of cheap and useful manufactures on the other, it is not only needless but would be irrational to suppose that she lies under any radical or incurable incapacity for excelling also in that intermediate sphere where the two join hands, and where Wedgwood gained the distinctions which have made him, in the language of Mr. Smiles, "the illustrious Wedgwood." I do not think that Wedgwood should be regarded as a strange phenomenon, no more native to us and ours than a meteoric stone from heaven—a happy accident without example and without return. Rare, indeed, is the appearance of such men in the history of industry; single perhaps it may have been among ourselves; for whatever the merit of others, such in particular as Mr. Minton, yet I for one should scruple to place any of them in the same class with Wedgwood—no one is like him, no one, it may almost be said, is even second to him; but the line on which he moved is a line on which everyone engaged in manufacture of whatever branch may move after him, and like him. And as it is the wisdom of man universally to watch against his besetting errors, and to strengthen himself in his weakest point, so it is the study and following of Wedgwood and Wedgwood's principles which may be confidently recommended to our producers as the specific cure for the specific weakness of English industry. Of imagination, fancy, taste, of the higher cultivation in all its forms, this great nation has abundance. Of industry, skill, perseverance, mechanical contrivance, it has yet a larger stock, which overflows our narrow bounds and floods the world. The one great want is to bring these two groups of qualities harmoniously together, and this was the peculiar excellence of Wedgwood; his excellence was peculiar in such a degree as to gain his name a place over every other, so far as I know, in the history of British industry, and remarkable and entitled to fame even in the history of the industry of the world. We make our first introduction to Wedgwood about the year 1741, as the youngest of a family of thirteen children, and as put to earn his bread at eleven years of age at the trade of his father, and in the branch of a "thrower." Then comes the well-known attack of small-pox, the setting of the disease in the lower part of the leg, and the amputation of the limb, rendering him lame for life. It is not often that we have such palpable occasion to record our obligations to the small-pox, but in the wonderful ways of Providence that disease, which came to him as a two-fold scourge, was probably the occasion of his subsequent excellence. It prevented him from growing up to be the active, vigorous English workman, possessed of all his limbs, and knowing right well the use of them; it put him upon considering whether, as he could not be that, he might not be something else, and something greater. It sent his mind inwards, and drove him to meditate upon the laws and secrets of his art: the result was that he arrived at the perception and the grasp of them, which might perhaps have been envied, and certainly had been owned, by an Athenian potter. Relentless criticism has torn to pieces the old legend of King Numa receiving in a cavern from the nymph Egeria the laws that were to govern Rome; but no criticism can shake the record of that illness and mutilation of the boy Josiah Wedgwood, which made for him a cavern of his bedroom and an oracle of his own inquiring, searching, inventive and fruitful mind. From those early days of suffering—weary perhaps to him as they went by, but bright surely in the retrospect lost to him and to us—a mark seems at once to have been set upon his career. But those who dwell upon his history have to deplore that many of the materials are wanting. It is not creditable to his country or his art that the life of Wedgwood should still remain unwritten. Here is a man, who in the well-chosen words of his epitaph, "converted a rude and inconsiderable manufacture into an elegant art, into an important branch of national commerce." Here is a man who beginning as it were from zero had, unaided by the royal or national gifts which were found necessary to uphold the glories of Sèvres, Chelsea, and of Dresden, produced works truer perhaps to the inexorable laws of art than the fine fabrics that proceeded from those establishments, and scarcely less attractive to the public taste. Here is a man who found his business cooped up within a narrow valley by the want of even tolerable communications, and who, while he devoted his mind to lifting that business from meanness, and ugliness, and weakness to the highest excellence of material and form, had surplus energy to take a leading part in great engineering works like the Grand Trunk Canal, from the Mersey to the Trent, which made the raw material of his industry abundant and cheap, which supplied a vent for the manufactured article, and opened for it materially a way to the outer world. Lastly, here is a man who found his country dependent upon others for its supplies of all the finer earthenware, but who by his single strength reversed the inclination of the scale and scattered his productions all over the breadth of the continent of Europe. And here I would say that

since I came to this room I have received a letter in which occurs the following quotation from the "Travels in England" of a French gentleman, M. E. Saint Fond. He says, referring to Wedgwood, "His excellent workmanship, its solidity, the advantage which it possesses of standing the action of fire, its fine glaze, impenetrable to acids, the beauty and variety of its form, and its moderate price, have created a commerce so active and so universal that in the dwellings from Paris to St. Petersburg, from Amsterdam to the farthest point of Sweden, fro n Dunkerque to the utter extremity of France, one is served at every inn from English earthenware. The same fine article adorns the tables of Spain, Portugal, and Italy; it pro vides the cargoes of ships for the East Indies, the West Indies, and America." It is strange that the life of such a man in this "nation of shopkeepers," as we are called, should at this date remain unwritten; but I have heard with much pleasure a rumour, which I hope is true, that such a gap in our literature is about to be filled up. All that we know, however of the life of Wedgwood seems to be eminently characteristic. We find the works of his earliest youth already impressing a new character upon his trade —a character of what may be called efficiency, combined with taste, and with the best basis of taste—a loving and docile following of nature. We find him beginning his partnerships when manhood was but just attained, first with Harrison, secondly with Whieldon, but as we might naturally expect in the case of a spirit so energetic and expansive, we find that in each of these cases the bed did not give him room enough to lie on or to turn in; and in 1759, as soon as his articles expire, he escapes from the unequal yoking, and enters into business by himself. But this, though a natural, was not a final stage. It was necessary that he who was the soul should also be the centre and head; but it was also necessary that he should surround himself at all points with an efficient staff, for a great, varied, and not merely reforming, but creative work. Hence he associated himself with Mr. Richard Bentley as a partner, who is stated to have chiefly superintended the London business, but who has credit for having supplied the information necessary to enable the firm to enter so largely on the handling of classical designs. Hence he employed Mr. Chisholm as an experimental chemist, and other scientific men in the several branches of the business. Hence his connexion with Flaxman, which has redounded alike to the honour of the one and of the other. It was once the fashion to say that Queen Elizabeth was not proved to be a woman of extraordinary power, but that she administered with vast ability; and in like manner some might be tempted to suspect, when they see Wedgwood thus surrounded, that his merit lay chiefly in the choice of instruments and coadjutors, and that to them the main part of the praise is due. What were the respective shares of Bentley and others in the great work of Wedgwood is a question of interest on which it may be hoped that we shall soon be more largely informed. It is plain that in an enterprise so extended and diversified there not only may, but must have been, besides the head, many assistants of merit sufficient to claim separate commemoration. As to the part which belongs to Flaxman, there is little difficulty; notwithstanding the distorting influence of fire, the works of that incomparable designer still in great part speak for themselves. To imitate Homer, Æschylus, or Dante, is scarcely a more arduous task than to imitate the artist by whom they were illustrated. Yet I, for one, cannot accept the doctrine of those who would have us ascribe to Flaxman the whole merit of the character of Wedgwood's productions, considered as works of art, and this for various reasons. First, from what we already learn of his earliest efforts, of the labours of his own hands, which evidence an elevated aim and a force bearing upwards mere handicraft into the regions of true plastic art, and again from that remarkable incident recorded in the history of the borough where he himself threw the first specimens of the black Etruscan vase, while Bentley turned the lathe. Secondly, because the very same spirit which presided in the production of the Portland or Barberini vase, or of the finest purely ornamental *plaques*, presided also in the production not only of *déjeûners* and other articles of luxury intended for the rich, but even of the cheap and common wares of the firm. The forms of the development were varied, but the whole circle of the manufacture was pervaded by a principle—one and the same. Thirdly, because it is plain that Wedgwood was not only an active, careful, clear-headed, liberal-minded, enterprising man of business—not only, that is to say, a great manufacturer, but a great man. He had in him that turn and fashion of true genius which we may frequently recognise in our engineers, but which the immediate heads of industry—whether in agriculture, manufactures, or commerce—have more rarely exhibited. It would be quite unnecessary to dwell on the excellencies of such of the works of Wedgwood as belong to the region of fine art strictly so called, and are not classed as commodities for use. To them all the world does justice. Suffice it to say, in general terms, that they may be considered partly as imitations and partly as reproductions of Greek art. As imitations they carry us back to the purest source. As reproductions they are not limited to the province of their originals, but are conceived in the genial and free spirit of that with which they have relationship. But it is not in happy imitation, it is not in the successful presentation of works of fine art that, as I conceive, the speciality of Wedgwood really lies. It is in the resuscitation of a principle—the principle of Greek art; it is in the conception and grasp of the unity and comprehensiveness of that principle. That principle, I submit, lies after all in a severe and perfect propriety in the uncompromising adaptation of every material object to its proper end. If that proper end be the preservation of beauty alone, then the production of beauty is alone regarded, and none but the highest models of it are accepted. If the proper end is the production of a commodity for use, and perishable, then a plural aim is before the designer and producer. The object must first and foremost be adapted to its use as closely as possible. It must be of material as durable as may be; it must be of the most moderate cost; then it must receive all the beauty which can be made conducive to or concordant with the use; and because this business of harmonising use and beauty—so easy in the works of nature —is arduous to the faculty of man, it must be made the object of special and persevering care. To these principles the works of Wedgwood habitually conformed. He did not in the pursuit of beauty overlook exchangeable value or practical usefulness. The first he could not overlook, for he had to live by his works, and it was from the profit derived from the constant sale of his humbler productions that he was enabled to bear the risks and charges of his higher works. Commerce did for him what the Kings of France did for Sèvres, and the Duke of Cumberland for Chelsea, viz., provided him with funds. And I would venture to say that the lower works of Wedgwood are as much distinguished by the fineness and accuracy of the adaptation to their uses as his higher ones by the successful exhibition of the finest art. Take, for instance, his common plates, of the value of a few pence each. They fit one another closely, as the cards in a pack. At least, I for one have never seen any plates that fit like those of Wedgwood, and become one solid mass. This accuracy of form must, I apprehend, render them much more safe in carriage. Of the excellence of these plates, we may take it for a proof that they were largely exported to France, if not elsewhere; that they were then printed or painted with buildings or scenes belonging to that country, and then sent out again as national manufactures. Again, take such a jug as he would have manufactured for the garret washhand table. I have seen these made apparently of the commonest material used in the trade, but instead of being built up like many more fashionable jugs of modern manufacture, in such a manner that a crane could not get his neck to bend into them, and that the water

cannot be poured out of them without risk of spraining of the wrist, they are constructed in a simple, capacious form of flowing curves, broad at the top, and so poised that a slight movement of the hand discharges the water. A round cheese-holder or dish generally presents in its upper part a flat space surrounded by a curved rim; but a cheese-holder of Wedgwood's will make itself known by this, that the flat is so dead a flat, and its curve so marked and bold a curve, as at once to furnish the eye with a line agreeable and well defined, and affording the utmost available space for the cheese. I feel persuaded that a Wiltshire cheese, if it could speak, would declare itself infinitely more comfortable in a dish of Wedgwood's than in any other dish. Again, there are certain circular inkstands by Wedgwood, which are thus described in the 21st section of the catalogue. Great care has been bestowed upon the mechanical arrangement with a view to the preservation of the pen and the economical and cleanly use of the ink. The prices are from sixpence to eight shillings, according to size and finish. I have one of them, not, however, black like those mentioned in the catalogue, but of his creamy white ware. I guess it must have been published at the price of a shilling or less. It carries a slightly rectilinear ornament, which agreeably relieves a form otherwise somewhat monotonous. It is so tasteful that it would not disgrace a cabinet, so plain that it would suit a counting-house. It has no pretension. All Wedgwood's works, from the lowest upwards, abhor pretension. Wedgwood always seems to have in view a standard of excellence indefinitely high. He never falls into extravagance or excess. I do not mean to say that all the works produced from his furnaces are equally satisfactory, but I am confident that it is easy, even from his cheapest and lower productions, to prove him to have been a man of real genius, thoroughly penetrated with the best principles of art. I have spoken of Wedgwood's cheapest, and also of his costliest productions; let me now say a word on those which were intermediate. Of these some appear to me to be absolutely faultless in their kind, and to exhibit, as happily as the remains of the best Greek art, both the mode and the degree in which beauty and convenience may be made to combine in manufacture. I have a slate coloured *déjeûner* of the ware which I believe is called Jasper ware. This seems to me a perfect model. The tray is a short oval, excessively light, with a surface soft as the finest flesh to the touch, having for ornament a mere scroll of white riband, very graceful in its folds, and shaded with partial transparency. The upper pieces have a ribbed surface, and a similar scroll re-appears, while for their principal ornament they are dotted with white quatrefoils. These quatrefoils are delicately adjusted in size to the varying circumferences, are executed with a rare feeling of nature, and with a precision that would scarcely do discredit to a jeweller. Enough, however, of observations on particular specimens of your great master's work. But let me hazard a few words yet on the general qualities of his business and his productions. It seems plain that though not educated in youth for any purpose of art, he contrived to educate himself to it amid the busy scenes of life. His treatise on the pyrometer shows that he had studied, or at any rate had acquired the science applicable to his art. His account of the Barberini vase proves that he had qualified himself to deal with the subjects of classical antiquity. But nothing can be more characteristic of his mind than the firmness with which, at the close of his catalogue, the intentions of the firm respecting cheap productions are declared. He has explained, as I have already mentioned, that the utmost cheapness can hardly be had along with the highest beauty. He goes on to indicate his prices as compared with those of others, and concludes his apology in terms which do the firm the highest honour, by declaring plainly "they are determine to give over manufacturing any article, whatsoever it may be, rather than to degrade it." A clear proof, I think, that something which resembles heroism has its place in trade. With this bold announcement to the world was combined, within the walls of his factory, the unsparing sacrifice of defective articles, which down to this day supplies the collector in many cases with the test he needs in order to ascertain the genuine work of Wedgwood. The lightness of Wedgwood's ware, which is an element not merely of elegance but of safety, the hardness and durability of the substances, the extraordinary smoothness and softness to the touch of the surfaces, their power of resisting heat and acids, the immense breadth of the field he covered, with the number and variety of his works in point of form, subject, size, and colour—this last, particularly as to his vases—his title almost to the paternity to the art of relief in modern earthenware; all these are characteristics which I am satisfied only to name. There are, however, two other points still on my mind—one the general character of his colours, the other his extraordinary merit as a restorer of forms in fictile products. The general character of his colour may perhaps be justly described as a strict sobriety imbibed from and closely following the antique. He did not attempt to cover the entire field of porcelain manufacture. That which is perhaps the noblest and most arduous part of all its work, modelling the human form in the solid, he rarely, if, indeed, he ever, attempted; and we must not look to him for the gay diversity of its colouring and subjects, or for the particular splendid effects yielded by its deep blue grounds. In no instance known to me does he indulge in showy colours. He has highly glazed vases in admirable taste, but usually, I think the ground is some variety of green or grey. He could not, however, have been insensible to the attractions of such colouring as was produced at Sèvres or at Chelsea. Where we find a general characteristic running through the works of a man like Wedgwood we may safely assume that there was a reason for it. Probably or possibly the reason for the restraint and sobriety of the colours of Wedgwood is to be found not in mere imitation, but in the classical severity of his forms. I hope it will not be thought presumptuous to give utterance to an opinion that the forms of many among the most costly and splendid vases which were produced at Chelsea and even at Sèvres in the last century were unsatisfactory; sometimes fantastic, often heavy and ungainly, rarely successful in harmonising the handles with the vessel, and upon the whole neither conformable to any strict law of art, nor worthy of the material. the fine colouring, drawing, composition, and gilding, there and elsewhere so often exhibited in the decoration. On comparing the forms of the vases with Wedgwood's, although these latter have doubtless suffered, as to their finest proportions, from shrinking in the fire, I think it is impossible to avoid feeling struck with his superiority, and feeling that his lifetime constitutes in fictile manufacture nothing less than a new era as to form. It is hard to avoid conjecturing that his eye must have noticed, and must in this respect have condemned, the prevailing fashion, and that he must have formed a deliberate resolution to do that which I think unquestionably he did, namely to exhibit to the world in this vital particular a much higher standard of excellence. Of the personal character of Wedgwood in its inner sense, the world has not yet been informed; but I can never presume otherwise than well of one who, in all those aspects which offer themselves to the view of the world, appears to have been admirable. For our present purpose, let us consider him only as a master, which is a matter of more than common interest at a time when so many of the most eminent firms in the district have in a manner the most laudable themselves called the attention of public authority to the condition of their younger labourers, with a view of obtaining the friendly aid of legislative interference for their instruction and protection. Indeed, we may say of the all-important question of the people what we said of the condition of the beauty in manufacture. The demand for cheapness presses hard upon it, yet nothing which depresses the moral or physical condition of the people below the standards of sufficiency and of health

can in the end be cheap. In the year 1769, when Wedgwood was promoting the Grand Trunk Canal, and building his works, and settling his colony at Etruria, Goldsmith published the beautiful poem of "The Deserted Village," which he chose with strange caprice to found upon the idle notion that it was the tendency of trade to depopulate the country. He says:—

> Ill fares the land, to hastening ills a prey,
> Where wealth accumulates and men decay.

Nor does he only mean that trades ill-regulated may be injurious to health. After describing rural happiness, he begins the lament—

> But times are altered, trade's unfeeling train
> Usurp the land and dispossess the swain.

What is most of all singular is, that he associates this substitution of towns for villages with decrease in the numbers of the people.

> If to the city sped, what waits him there?
> To see profusion that he must not share:
> To see ten thousand baneful arts combin'd
> To pamper luxury and thin mankind.

Now at any rate, Wedgwood's does not appear to have been one of those "baneful arts." Listen to the account given by Mr. Smiles of the way in which Wedgwood thinned mankind:—"From a half-savage, thinly populated district of some 7,000 persons, partially employed and ill-remunerated, we find them increased, in the course of some twenty-five years, to about treble in population, abundantly employed, prosperous, and comfortable." Nor was this multiplication only, without improvement, for he goes on to quote from John Wesley, who had been pelted at Burslem, in 1760, the following remarkable words: "I returned to Burslem. How is the whole face of the country changed in about twenty years, since which inhabitants have continually flowed in from every side; hence the wilderness is literally become a fruitful field. Houses, villages, towns, have sprung up, and the country is not more improved than the people." It is impossible to conceive a testimony more honourable to Wedgwood. Nor can I better conclude these remarks than by uttering the cordial hope that you, his successors, who have during late years earned so much honour for the taste and industry of the country, may profit more and more effectually by the lessons which your great forerunner has bequeathed you, and may find at least one substantial part of your reward in witnessing around you a thriving and contented, a healthy and a happy population.

In the evening a banquet took place in the Town Hall.

BRITISH ASSOCIATION, NEWCASTLE-UPON-TYNE, 1863.

On the Manufacture of Aluminium. By Isaac Lowthian Bell, Mayor of Newcastle.

The progress of the manufacture of this—so far as the arts are concerned—new metal has scarcely been such as to require much to be added to those admirable researches bestowed upon the process by the distinguished chemist, M. St. Clare Deville, of Paris. Upon the introduction of its manufacture at Washington, three and a half years ago, the source of the alumina was the ordinary ammonia of commerce — a nearly pure sulphate of alumina and ammonia. Exposure to heat drove off the water, sulphuric acid, and ammonia, leaving the alumina behind. This was converted into the double chloride of aluminium and sodium by the process described by the French chemist and practised in France, and the double chloride was subsequently decomposed by fusion with sodium. Faint, however, as the traces might be of impurity in the alum itself, they to a great extent, if not entirely (being of a fixed character when exposed to heat) were to be found in the alumina. From the alumina, by the action of chlorine on a heated mixture consisting of this earth, common salt, and charcoal, these impurities, or a large proportion thereof, found their way into the sublimed double chloride, and, once there, it is unnecessary to say that, under the influence of the sodium in the process of reduction, any silica, iron, or phosphorus found their way into the aluminium sought to be obtained. Now, it happens that the presence of foreign matters, in a degree so small as almost to be infinitesimal, interferes so largely with the colour, as well as with the malleability of the aluminium, that the use of any substance containing them is of a fatal character. Nor is this all, for the nature of that compound which hitherto has constituted the most important application of this metal—aluminium-bronze—is so completely changed by using aluminium containing the impurities referred to that it ceases to possess any of those properties which render it valuable. As an example of the amount of interference exercised by very minute quantities of impurity, it is perhaps worthy of notice that very few varieties of copper have been found susceptible of being employed for the manufacture of aluminium-bronze; and hitherto we have not at Washington, nor have they in France, been able to establish in what the difference consists between copper fit for the production of aluminium-bronze and that which is utterly unsuitable for the purpose. These considerations have led us, both here and in France, to adopt the use of another raw material for the production of aluminium, which either does not contain the impurities referred to as so prejudicial, or contains them in such a form as to admit of their easy separation. This material is Bauxite, so called from the name of the locality where it is found in France. It contains—

Silica	2·8
Titanium	3·1
Sesquioxide of iron	25·5
Alumina	57·4
Carbonate of lime	0·4
Water	10·8
	100·0

The Bauxite is ground and mixed with the ordinary soda-ash of commerce, and then heated in a furnace. The soda combines with the alumina, and the aluminate of soda so formed is separated from the insoluble portions, viz., peroxide of iron, silico-aluminate of soda, &c., by lixiviation. Muriatic acid or carbonic acid is then added to the solution, which throws down pure alumina. The remainder of the process is precisely that which is described by Mons. St. Claire Deville. The alumina is mixed with common salt and charcoal, made into balls the size of an orange, and dried. These balls are placed in vertical earthern retorts, kept at a red heat, and through the heated contents chlorine gas is passed. The elements of the earth, under the joint influence of carbon and chlorine at that temperature, are separated—the carbon taking the oxygen, and the chlorine the aluminium. The latter substance, accompanied by chloride of sodium (common salt), sublimes over, and is collected, as a double chloride of aluminium and sodium. In small iron retorts, kept at as high a temperature as iron can bear, a mixture of soda (carbonate of soda), and carbonaceous matter, with a little ground chalk is placed. The metallic base of the alkali distils over and is collected in coal oil. A portion of the double chloride and sodium, along with fluxes, is exposed to a full red heat in a reverberatory furnace. The sodium seizes the chlorine combined with the aluminium, and thus liberates the latter metal, which falls to the bottom of the fused mass.

Aluminium is used in sufficient quantity to keep the only work in England, viz., that at Washington, pretty actively employed. As a substance for works of art, when whitened by means of hydrofluoric and phosphoric acid, it appears well adapted, as it runs into the most complicated patterns, and has the advantage of preserving its colour, from the absence of all tendency to unite with sulphur, or to become affected by sulphuretted hydrogen, as happens with silver.

A large amount of the increased activity in the manufacture referred to is due to the exceeding beauty of the compound with copper, already spoken of, which is so like gold as scarcely to be distinguishable from that metal, while it possesses the additional valuable property of being nearly as hard as iron.

This alloy, or aluminium bronze, as it is termed, is a discovery of Dr. John Percy, F.R.S., and appears to be a true chemical compound. Copper is melted in a plumbago crucible, and after being removed from the furnace, the solid aluminium is added. The union of the two metals is attended with such an increase of temperature, that the whole becomes white hot, and unless the crucible containing the mixture is of refractory material, a vessel which has resisted a heat sufficient to effect the fusion of copper melts when the aluminium is added.

Mr. Gordon, was the first, it is believed, who detected and determined the amount of tension wire of aluminium bronze was capable of resisting, which he found to be between that of the best iron and the best steel wire. Colonel Strange, of the Royal Astronomical Society, investigated its properties, which were given in a very able paper in the transactions of that body. Its malleability, ductility, and capability of being finely divided and engraved upon, along with its great strength, induced the Colonel to recommend its adoption in the theodolite used in the Trigonometrical Survey of India.

At the Elswick Ordnance Works, Captain Noble, R.A., confirmed previous experiments on the capability of aluminium bronze to resist longitudinal and transverse fracture, and in addition to this he ascertained that its position to withstand compression stood halfway between that of the finest steel and the best iron.

The bronze, containing ten parts of aluminium and ninety of copper, affords an alloy endowed with the greatest strength, malleability, and ductility. The colour of the copper is affected by a very trifling addition of the other constituent, and the alloy gradually improves in those valuable qualities just mentioned until the proportions given above are reached. After this, *i.e.* when more than ten per cent. of aluminium enters into the composition of the bronze, the alloy gradually becomes weaker and less malleable, and at length is so brittle that it is easily pounded in a mortar.

THE PROGRESS OF THE TEA TRADE.

By P. L. Simmonds.

Among the immense number of persons who deal in, and daily consume tea, there are probably fewer acquainted with the early history and enormous progress of consumption of this article of commerce than is the case with many other large articles of trade. The import and use of tea has already made and is yearly making such rapid strides, that it is difficult to keep pace with the figures, and a short *résumé*, brought down to the present time, may, therefore, not be without interest to many.

The benefits that have resulted from the general introduction of tea amongst the necessaries of life are inestimable. Besides adding an important article to the commerce of this country, it has become a most valuable auxiliary to the health, comfort, and happiness of all classes. The old cynic, Dr. Johnson, would cease his growling and make himself interesting over Mrs. Thrale's twelfth cup of tea. "It is poison," said some *bon vivant* to him. "Sir," he replied, "it may be poison, but I have been seventy years dying of it;" and he drained another bowl. The loquacious Coleridge would indulge in a monologue of an hour's length, holding his hearers spell-bound, on the virtues of tea, and write articles upon the most approved mode of decocting it. The quiet and gentle Elia, with his loved and loving sister, received solace and comfort after his toilsome labours at the India House by imbibing the refreshing and invigorating beverage.

For gentle, as well as simple, tea has its attractions. John Chinaman uses it habitually, as we do water, to quench his thirst, or as many do alcohol to excite, while the rich and fashionable with us regard it as an essential appendage to the breakfast table and social evening circle. The lonely shepherd in the Australian bush, the miner at the gold-fields, the ice-bound navigator in the Arctic regions, the day labourer after his toil, the washerwoman, all receive comfort from their use of tea, and the scholar has his mind strengthened, his wit sharpened, his nerves more firmly strung by the healthful potation. Tea is the great domestic panacea—soothing, cheering, comforting, stimulating, and invigorating all who partake of it.

This was not the general opinion entertained of tea on its early introduction. For, a writer in the *Grub-street Journal*, in 1737, says:—"If we compare the nature of tea with the nature of English diet, no one can think it a proper vegetable for us. Its essential salt does not hold moisture enough to be joined to the body of an animal; its oil is but very little, and that of the opiate kind, which irritates and frets the nerves. But were it entirely wholesome, as balsam or mint, it were yet mischief enough to have our whole population used to sip warm water in a mincing manner twice a day. Tea gives an effeminate turn to the people."

My object, however, is not to eulogise tea, but to enter into the more practical matter-of-fact details of supply and demand.

In 1766, the whole quantity of tea imported into Europe amounted to about 17,000,000 lbs.; in 1785, it was computed at 19,000,000 lbs. Last year the imports into this kingdom alone were 114,787,452 lbs., while the United States consume about 37,000,000 lbs., and the continent of Europe nearly a similar quantity.

In 1788, the consumption of tea in the United Kingdom was 14,764,565 lbs.; in 1800, 23,272,000 lbs.; in 1830, 30,046,935 lbs.; in 1860, 76,859,428 lbs.; and in 1862, 78,817,060 lbs.

Taking the population of the United Kingdom at 29,000,000, the average consumption of tea per head, last year, was about 2¾ lbs., a very considerable increase upon former periods, as the following data will show:—

	lbs. consumed.	Average.	Duty.
1831	29,997,101	1 lb. 4 oz.	96 per cent.
1841	36,675,667	1 lb. 6 oz.	2s. 1d. per lb.
1851	53,965,112	1 lb. 13 oz.	2s. 2¼d. ,,
1862	78,817,060	2 lb. 12 oz.	1s. 5d. ,,

The total duty received on tea in the last four years has varied but little, approximating very closely to £5,500,000. Indeed, last year's consumption brought in as much to the Exchequer, under the 1s. 5d. duty, as the 2s. 2d. duty did in 1850, arising out of the large increase of tea consumed between the two periods, from 50,000,000 lbs. to 79,000,000 lbs.

This enormous increase must have taken some statists by surprise. Mr. Montgomery Martin, when Treasurer of Hong Kong, drew up and transmitted to the Home Government, in July, 1845, an official report, in which occur the following passages:—

"It is more than probable that tea has now reached the limit of production in England [it was then 44,000,000 lbs.], and that any reduction of duty would not augment the use of this innutritious leaf."

"Tea," he adds, "is neither a nutriment nor a necessary of life. Its use does not improve the physical stamina of the people; in fact, it acts the very reverse by its injurious effects on the nervous system, unless when accompanied by a full diet of animal food and fermented liquors. Again, the position, soil, and climate adapted for the growth of tea in China is limited, and no large quantity of drinkable tea could be suddenly obtained in China; any reduction of duty would, therefore, not lessen the price of tea to the consumer."

The statistics already given show that tea has not even

yet reached the limit of consumption, although nearly 35,000,000 lbs. more are used now than in 1845, and that reduction of duty, while it has enormously increased imports, has not enhanced prices, nor exhausted the producing capabilities of China, whilst Japan and India have gone extensively into the cultivation and manufacture.

Considering the enormous labour of manufacturing tea, it is surprising that even the poorest kind can be afforded to the foreign purchaser at the Chinese ports at the low price at which it is obtained. In their ability to furnish it at this rate, the Chinese have a security for retaining the trade in their hands, notwithstanding the efforts making to grow the plant in India and elsewhere. The vast extent of the Chinese Empire, the cheapness of labour there, and its capabilities of raising unlimited quantities of tea, negative the idea that any fear need exist of ever exhausting this supply. Although consumption, since the commencement of the century, has so enormously increased in the United Kingdom, the prices in all markets have declined.

EDUCATION OF THE DEAF AND DUMB.

The number of schools for the deaf and dumb has been rapidly increasing during the current century. At the beginning of the century there were hardly a dozen such schools. Thirty years ago the number of European institutions for the deaf and dumb was about 118, containing, at most, 3,300 pupils. Ten years ago the number of institutions was estimated at 180, and the number of pupils at 6,000. Of the European institutions there are about 80, mostly small ones, in Germany, 45 in France, and 22 in the British Isles. There are also two or three schools in British America. The three largest European schools are those of London, with about 300 pupils, Paris with about 170, and Groningen, in Holland, with about 150.

The number of American institutions has also steadily increased. The American Asylum at Hartford is the oldest, having been opened in 1817. The New York institution is next in age, dating from 1817, and the Pennsylvania institution was opened in 1820. The Kentucky institution was opened in 1823, that of Ohio in 1829, and that of Virginia in 1839. The progress of the cause may be seen by the annexed table:—

Date.	No. of Institutions.	No. of Teachers.	No. of Pupils.
1834	6	34	466
1851	13	75	1,162
1857	20	118	1,760
1860	22	130	2,000

The New York institution is the largest in the country, and probably in the world, having 310 pupils. The asylum at Hartford has about 225, the institution at Philadelphia 206, and the schools of Ohio, Indiana, and Illinois from 140 to 170. The southern institutions are comparatively small, but their present condition cannot be ascertained. Of the 130 teachers, including the principals, about half are men of liberal education, about 15 are females, and about 50 are educated deaf-mutes.

The support of these twenty-two institutions costs not far from 350,000 dollars annually, of which as much as 300,000 dollars is appropriated by the legislatures of twenty-nine States. Provision for the education of the deaf and dumb, in some cases restricted to the indigent, in others made free to all, is made by law in all the States, except the sparsely settled ones of Florida, Arkansas, Minnesota, Kansas, and Oregon. All the New England States send their beneficiaries to Hartford, New Jersey sends hers to New York and Philadelphia, and Maryland and Delaware send theirs to Philadelphia, or to the institution at Washington, under the patronage of the President and Congress.

In the buildings and grounds of these several institutions, up to the date of the last information, over a million and a-half of dollars had been invested. Except the necessary buildings and appurtenances, the institutions generally possess no permanent funds, being dependent on annual appropriations from the states, but there are three or four exceptions. The only considerable permanent fund is that of the American Asylum, derived from a grant of a township of land, made by Congress, through the generous aid of Henry Clay, as early as 1819. This fund now amounts to 200,000 dollars. The Texas institution has been munificently endowed by the legislature of that State with a grant of 100,000 acres of land.

In estimating the cost of instructing the deaf and dumb of the United States, it must be remembered that seven of the twenty-two institutions, those of Virginia, North Carolina, South Carolina, Louisiana, Michigan, California, and the Columbian Institution in Washington, are also institutions for the blind as well as for the deaf and dumb, and that the support of their 136 blind pupils is included in the sum already given as the total annual expense of the twenty-two institutions. Allowing for these, the actual expense of educating the 2,000 deaf-mutes now in school may be estimated at 330,000 dollars. The number now under instruction ought to be considerably larger, especially in the southern States, to give all the deaf and dumb that education which alone can raise them to the rank of intelligent and useful citizens. It is restricted less from the difficulty of obtaining appropriations from the State legislatures than from the apathy of unenlightened parents, and their unwillingness to part with their children.

ARTIFICIAL FERTILISATION OF CROPS.

A singular discovery has lately been announced in France. The discovery however is that of a Dutchman, M. Hooibrenk, and the results of his researches have been so well marked and valuable that he has been awarded the Cross of the Legion of Honour by the Emperor, who has directed that a scientific commission be appointed to investigate and report upon the matter. M. Hooibrenk supposes that the number of grains in an ear of corn can be increased by bringing a larger quantity of pollen into contact with the stigmate than they usually receive. He conducts his experiments as follows:—He takes a cord of from twenty-five to thirty yards long, and fastens to it a stiff woollen fringe of about ten inches long; he steeps it for a short time in honey, and drags it over the fields of corn two or three times after flowering. It catches the pollen from the anthers and applies it to the stigmata (it is, in fact, Mr. Darwin's bee-process on a gigantic scale), and the result is a greatly increased crop. This method has been tried in conjunction with the old one, on a farm near Epernay, in Champagne, the property of the celebrated wine dealers, Messrs. Jaquesson. The results beneath show the relative advantages of both systems:—

	Hooibrenk's System. Kilogrammes.	Old System. Killogrammes.
Wheat	31	21
Rye	25·5	16
Barley	24	16
Oats	17	12

It has been conjectured that the results would have been still more striking had not this season been such a favourable one. Fruit and garden vegetables have been similarly treated, and with a like success. It has been found also that an inclination of 112° of the branches of the vine produces some effect upon the flow of the sap, and increases the fruit crop. M. Hooibrenk maintains that by his process, and without any material additional outlay, crops of fruit, vegetables, and corn can be increased in value 50 per cent.

MEETINGS FOR THE ENSUING WEEK.

MON. .. Medical, 8½. Mr. De Méric, "Occasional Non-transmission of Syphilis to the Offspring."
Royal Inst. 2. General Monthly Meeting.
TUES. ...Anthropological, 8. 1. Mr. C. Carter Blake, F.G.S., "On the Anthropological Papers read at the British Association." 2. Professor John Marshall, F.R.S., "On Microcephalic Brains." 3. Mr. G. E. Roberts and Professor Busk, F.R.S., "On the opening of a Cist at Burghead." 4. Capt. E. W. Jacob, "On the Indian Tribes of Vancouver's Island."
Geologists' Association, 7. Mr. Carter Blake, F.G.S., "On Fossil Elephants."
WED. ...Geological, 8. 1. Sir P. de M. G. Egerton, F.R.S., F.G.S., "On some Ichthyolites from New South Wales." 2. Mr. A. Leith Adams, A.M., "Notes on the Geology of a portion of the Nile Valley." (Communicated by L. Horner, Esq., F.R.S., V.P.G.S.)
THUR....Chemical, 8. 1. Dr. Sprengel, "Detection of Nitric Acid." 2. Dr. Thudichum, "Physiological variations of hippuric acid in human urine."

PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette, October 23rd*, 1863.]

Dated 15th June, 1863.

1491. W. W. Box, Birmingham—Imp. in fire-bars for the boilers of locomotive and other engines, and for fire-boxes and furnaces generally.

Dated 11th July, 1863.

1739. H. Greaves, Abingdon-street, Westminster—Imp. in the construction of railways and tramways.

Dated 11th September, 1863.

2241. L. Meyer, 36, Rue de Marseille, Paris—Improved means of and apparatus for employing vapours, gases, and the heat derived from combustible matters.

Dated 18th September, 1863.

2300. H. C. Huskinson, Manchester—Imp. in the manufacture of buttons.

Dated 26th September, 1863.

2373. L. H. Norris, 6, Upper Bedford place, Russell square—Imp. in the manufacture of india rubber and gutta percha compounds. (A com.)

Dated 6th October, 1863.

2443. W. Holgate, H. Holgate, and T. Holgate, Accrington, Lancashire—Imp. in the manufacture of pickers used in weaving.

Dated 7th October, 1863.

2449. D. Barr, Birmingham—Imp. in apparatus for regulating and working window blinds.

Dated 8th October, 1863.

2463. A. P. Charpentier, Palais Royal, Paris—Imp. in the manufacture of watches.
2467. W. Lorberg, 4, Wild's-rents, Bermondsey—Imp. in the manufacture of gas from tar.
2469. R. G. Watson and W. J. Kendall, Preston, Lancashire—An improved walking-stick umbrella.
2471. J. Spencer, Doncaster—Imp. in machinery for separating different sizes of roots.

Dated 9th October, 1863.

2477. G. Parry, Ebbw Vale Iron Works, Monmouthshire—Imp. in refining crude pig iron and in furnaces connected therewith.
2479. J. Mather, Crow Oaks, near Radcliffe, Lancashire—Imp. in friction or glazing calenders.

Dated 10th October, 1863.

2485. J. Vaughan, Middlesborough, Yorkshire—Improved apparatus for purifying waste gases from blast and other furnaces.
2487. J. Ruthardt and F. Thiele, Oxford-market, Oxford-street—Imp. in apparatus for purifying and increasing the illuminating power of gas.
2491. T. Hughes, Wolverhampton—Imp. in the manufacture of lanthorns.

Dated 12th October, 1863.

2493. P. R. Jackson, Salford—Imp. in the manufacture of hoops and tyres for railway wheels and other purposes, and in the machinery employed therein.
2495. J. G. Hartley, 11, Laurence Pountney-lane—Imp. in the construction of iron and wooden ships and other vessels.
2497. W. T. Bury, Regent Works, Sheffield—An imp. in vessels or baths for containing heated metals and fluxes employed in the processes of hardening and tempering steel and steel articles.
2499. T. Gidlow, Heaton, Lancashire—Certain imp. in bearings for axles for railway or other carriages.
2501. W. E. Gedge, 11, Wellington-street, Strand—Imp. in shears for cutting metals and other substances. (A com.)
2503. R. Aitken, Cambridge-street, Pimlico—Imp. in the permanent way of railways.
2505. J. J. Anderton, Saint James's-street, Northampton—Imp. in machinery for cutting and finishing the edges of the soles and heels and the bottoms of boots and shoes.

Dated 13th October, 1863.

2507. G. Morgan, 3, Budge-row—An improved "sample" bag for postal and other purposes.
2511. T. C. Craven, Greenbush, U.S.—Imp. in cotton gins.
2513. J. Fowler, Leeds—Imp. in apparatus used for hauling agricultural implements.

Dated 14th October, 1863.

2515. J. Rowley, Leeds—Imp. in apparatus for washing, scrubbing, scouring, bleaching, and discharging impurities or other matters from woven or other fibrous materials.
2517. E. P. Colquhoun and J. P. Ferris, 1, Lawrence Pountney-hill—Imp. in fire-bars for the furnaces of steam boilers, and the mode of mounting the same.
2519. J. Milton, Paisley—Imp. in looms for weaving.
2521. O. E. Sonnenstein, Minories—Imp. in reflecting apparatus. (A com.)

INVENTIONS WITH COMPLETE SPECIFICATIONS FILED.

2522. H. A. Bonneville, 24, Rue du Mont Thabor, Paris—An improved apparatus for cleaning ships' hulls. (A com.)—14th October, 1863.
2546. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in washing machines. (A com.)—17th October, 1863.

PATENTS SEALED.

[*From Gazette, October 23rd*, 1863.]

23rd October.

1022. J. Cornes and J. C. Davis.
1033. J. P. Nunn & E. B. Nunn.
1050. M. Valkenhuysen.
1056. W. Hudson and C. Catlow.
1061. S. Crabtree.
1062. G. Hall and J. Wells.
1063. A. Kinder.
1069. T. Moore.
1077. W. Tarr and E. Farr.
1079. E. Leigh and F. A. Leigh.
1082. M. Barland and E. H. C. Monckton.
1087. J. Wibberley.
1022. C. P. Stewart and J. Kershaw.
1093. J. Appleby.
1097. W. Clissold.
1098. W. G. Craig.
1104. J. Purdey.
1107. J. T. Oakley & T. Oakley.
1133. G. Davies.
1172. J. Burrell.
1174. J. Burrell.
1200. H. Wilde.
1367. L. S. Chichester.
1758. J. Holmes, G. T. Holmes, and F. R. Holmes.
1782. H. Elliott.
1791. N. Thompson.
1962. J. Thornton, J. Thornton, A. Thornton, and W. Thornton.
2072. W. E. Newton.
2226. A. V. Newton.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

[*From Gazette, October 27th*, 1863.]

19th October.

2605. H. Cook.
2634. W. E. Newton.

20th October.

2566. E. W. Hughes.
2643. T. Greenwood and J. Dockray.

21st October.

2584. C. Lunley.
2527. J. Chisholm, G. Chisholm, and R. T. Kent.

22nd October.

2582. R. Baynes.
2688. W. Clark.

23rd October.

2578. W. H. Tylor.
2610. W. Sharpe.

24th October.

2612. T. Cobley.
2618. W. Syrett.
2677. J. Bettyes.

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

[*From Gazette, October 27th*, 1863.]

19th October.

2530. J. Armstrong.

20th October.

2545. P. Fairbairn & R. Newton.

21st October.

2480. G. Erman.
2576. S. Tearne and G. W. Richmond.

LIST OF DESIGNS OF UTILITY REGISTERED.

No. in the Register.	Date of Registration.	Title.	Proprietor's Name.	Address.
4586	Oct. 15.	Blast Cylinder	Richald Howson, Edwin Francis Jones	Middlesborough.
4587	,, 17.	Improved Feeding Trough	Jas. F. M. Hawkins	Northall, Dunstable.
4588	,, 19.	Invalid's Bed Bath	Jas. E. Maddox	19, University-street, Bedford-square.
4589	,, 24.	Counter Box for Coffee and other materials.	Pryce Hughes	14, London-street, Paddington.